

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)



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Applicant's or agent's file reference WA-421	FOR FURTHER ACTION		See Form PCT/IPEA/416
International application No. <b>PCT/KR2004/001529</b>	International filing date(day/month/year) <b>24 JUNE 2004 (24.06.2004)</b>	Priority date (day/month/year) <b>01 OCTOBER 2003 (01.10.2003)</b>	
International Patent Classification (IPC) or national classification and IPC  <b>E04C 3/293(2006.01)i</b>			
Applicant  <b>B.B.M. KOREA CO., LTD. et al</b>			

- This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 4 sheets, including this cover sheet.
- This report is also accompanied by ANNEXES, comprising:
  - ☐ (sent to the applicant and to the International Bureau) a total of \_\_\_\_\_ sheets, as follows:
    - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
    - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
  - ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) \_\_\_\_\_ containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box relating to Sequence Listing (see Section 802 of the Administrative Instructions).
- This report contains indications relating to the following items:
  - ☒ Box No. I Basis of the report
  - ☐ Box No. II Priority
  - ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - ☐ Box No. IV Lack of unity of invention
  - ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - ☐ Box No. VI Certain documents cited
  - ☐ Box No. VII Certain defects in the international application
  - ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand  <b>21 MARCH 2005 (21.03.2005)</b>	Date of completion of this report  <b>25 JANUARY 2006 (25.01.2006)</b>
Name and mailing address of the IPEA/KR  Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer  <b>JEONG, Kyu Young</b>  Telephone No. 82-42-481-8124

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/KR2004/001529

## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☒ This report is based on translations from the original language into the following language English, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☒ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

- ☒ the international application as originally filed/furnished
- ☐ the description:
- pages \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ the claims:
- pages \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ as amended (together with any statement) under Article 19
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ the drawings:
- pages \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ the sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/KR2004/001529

**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****I. Statement**

Novelty (N)	Claims	1 - 12	YES
	Claims		NO
Inventive step (IS)	Claims	1 - 12	YES
	Claims		NO
Industrial applicability (IA)	Claims	1 - 12	YES
	Claims		NO

**2. Citations and explanations (Rule 70.7)**

Reference is made to the following documents:

D1: KR 1999-0017099 A (15 March 1999)

D2: JP 04-030048 A (03 February 1992)

D3: US 6088985 A (18 July 2000)

D1 relates to a connection structure to join a reinforced concrete column with a steel beam and a manufacturing method thereof. D2 relates to a shear connector for composite beam. D3 relates to a structural tie shear connector for concrete and insulation sandwich walls.

**Novelty**

The present invention relates to a shear connector in a T-shaped or Z-shaped steel plate, comprising a flange and a web having through holes, wherein the flange is formed of flange pieces which are cut out in biased shapes, so as to enhance weight resistance and transformation resistance.

The formation of through holes in the shear connector and the formation of flange pieces by cutting out the flange as described in the present application are not disclosed in D1-D3. Therefore, the subject matter of claims 1-12 is considered to be novel.

(Continued on Supplemental Sheet.)

**Supplemental Box**

In case the space in any of the preceding boxes is not sufficient.  
Continuation of:

Box V.

Inventive Step

The followings are comparisons between claims 1-12 and D1-D3:

Claim 1 of the present application relates to a shear connector in a T-shaped steel plate comprising a flange and a web having a plurality of through holes. The structure of the shear connector according to claim 1, which is characterized by the formation of through holes in the flange and the web which the T-shaped shear connector comprises, differs from the structure of the shear connector according to D1-D3. In addition, said different structure leads the invention claimed in claim 1 to have a particular effect.

Therefore, the subject matter of claim 1 is considered to involve an inventive step. The subject matter of claims 2-4 referring to claim 1 is also considered to involve an inventive step.

Claim 5 relates to a shear connector in a T-shaped steel plate comprising a flange formed of flange pieces and a web having through holes. The structure of the shear connector according to claim 5 differs from the structure of the shear connector according to D1-D3, and said different structure leads the invention claimed in claim 5 to have a particular effect.

Therefore, the subject matter of claim 5 is considered to involve an inventive step. The subject matter of claims 6-8 referring to claim 5 is also considered to involve an inventive step.

Claim 9 relates to a shear connector in a Z-shaped steel plate comprising an upper flange and a web having a plurality of through holes. The structure of the shear connector according to claim 9 differs from the structure of the shear connector according to D1-D3, and said different structure leads the invention claimed in claim 9 to have a particular effect.

Therefore, the subject matter of claim 9 is considered to involve an inventive step. The subject matter of claims 10-12 referring to claim 9 is also considered to involve an inventive step.